

## MANAGEMENT INDICATOR SPECIES— COMMONLY HUNTED BIG GAME

### Introduction

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The three most common ungulates (elk, mule deer, and white-tailed deer) are used as Management Indicator Species for the commonly hunted big game species (LRMP II-21). At the forest level, meeting these species' habitat needs indicates that the needs of species such as black bear, moose, and mountain lion will also be met. Their basic habitat needs of cover, forage, and security are similar and may be altered by human actions in similar ways (Joslin and Youmans 1999, Witmer et al. 1998). During the formulation of Forest Plan, it was assumed standards designed for elk would also be adequate for mule deer because they both tend to use similar habitats. White-tailed deer are more closely associated with riparian features, but because nearly 85 percent of the Logan Creek area is within one-quarter mile of water (Exhibit Rr-5), the habitat analysis for this project also applies to white-tailed deer.

Timber harvest and salvage, major insect epidemics, and fire typically remove or alter hiding and thermal cover used by large mammals. In many situations, these disturbances create temporary foraging areas with associated increases in diversity and edge, which typically allows for proliferation of big game species. In northwest Montana, the extent that large animals will make use of a natural or man-made opening depends on an animal's experience, seasonal forage quality, proximity of security cover, presence of roads, and intensity of human use. Openings can decrease ungulates' ability to travel within their home ranges, as well as making them more vulnerable to predation and hunting. When sufficient downed woody material, residual understory trees, and wind firm live trees and snags are available, timber harvest can maintain adequate hiding cover values.

Research findings and management guidelines for these species are generally consistent. A study of white-tailed deer summer habitat use for the Tally Lake Ranger District (Morgan 1993; Exhibit Rb-5) indicated that minimal impact would result from timber harvest on northern aspects, ridge tops, sites greater than 2450 feet from riparian zones, and in elevations below 3477 feet and above 4938 feet. Morgan also stressed the value of immature and pole-sized timbered stands. White-tailed deer habitat guidelines written by Montana Department of Fish, Wildlife, and Parks (MDFWP) biologists recommend maintaining or establishing a zone of "arboreal vegetation" at least 100 feet or 1.5 sight distances from the edge of riparian features (Riley and Cross 1983; Exhibit Rb-6). They also suggested maintaining upland corridors and encouraging multi-species timber stands. Research indicates that white-tailed deer prefer to have hiding cover within approximately 165 feet (Riley and Cross 1983), and elk approximately 500 feet (Thomas and Toweill 1982). Timber management to optimize deer habitats in western Montana "should emphasize perpetuation or enhancement of habitat diversity" (Mackie, et al. 1998). Spring, summer and fall months are important periods when ungulates give birth to and nurse calves and fawns; grow antlers; build body condition; accumulate fat for enduring the winter months; and endure the stress of the big game hunting

season. Mature Douglas-fir stands provide critical fawn-rearing habitats (Pac, et al. 1991) and should be associated with high-quality foraging areas and security.

Hunters can displace elk from preferred habitats to larger, less diverse patches of cover (Lyon and Canfield 1991). During hunting season, elk appear to require contiguous, nonlinear hiding cover patches over 250 acres in size and more than one-half mile from open roads (Hillis et al., 1991) in order for the elk population to provide continued hunter opportunity and a diverse bull age structure (Youmans 1991).

Effects on Commonly Hunted Big Game Management Indicator Species tie directly to three issues discussed in Chapter 1. These are Issue #1, “Wildlife Security”; Issue #3, “Landscape dynamics--connectivity”; and Issue #4, “Landscape dynamics--Seral/structural stage patch size and shapes.” Issue indicators involve elk hunting season security areas, available forage, and public motorized road access. These issues were instrumental in the development of Alternative C (Exhibit E-3). The No Action Alternative could also affect their habitat across the analysis area through changes in the probability for intense wildland fire.

### **Differences Between the DEIS and FEIS**

This section of the FEIS about Commonly Hunted Big Game differs from the same section in the DEIS in that analysis for new Alternative F was included. An additional literature citation (Witmer et al. 1998) was added to the FEIS. Reference to a new Project File exhibit about road closure effectiveness monitoring was added, as well as information about timing of activities on actual big game winter range. A correction was made to the acres of cover altered by the alternatives. Cross-references were made to subsections of the Vegetation section of Chapter 3.

## **Information Sources**

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The effects on elk, mule deer, and white-tailed deer are discussed in relationship to acres and the spatial arrangement of hiding cover lost, as well as ease of human access. The analysis was done through GIS calculations of the different types of habitat planned for harvest in each alternative and by manually overlaying GIS-generated maps of cover with alternative maps for spatial information. Hunting season security values were derived through GIS procedures that detected areas of continuous cover further than one-half mile from open roads, and then screened out (omitted) areas of less than 250 acres (Exhibit Rb-1). Road information can be found in Exhibit Rg-8. Effects on connectivity cover are in Exhibit Rg-9.

## **Analysis Area**

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The analysis area for commonly hunted big game is the Logan Creek watershed down to the confluence with Good Creek, but excluding the Griffin and Sheppard drainages. This area is the same as the Logan Geographic Unit used for Ecosystem Analysis at the Watershed Scale. At approximately 61,266 acres (96 square miles), it is large enough to include the home range of these species using riparian habitats and is representative of effects of fires, natural tree

mortality, timber harvest, and firewood cutting across the landscape. Hiding cover, summer thermal cover, available water, security areas, and foraging areas are distributed across these drainages, with winter range occurring on warmer, drier slopes. Since nearly 85 percent of the area is within one-quarter mile of riparian features (Exhibit Rr-5), conditions across the whole area are representative of habitats within such “key use” areas for white-tailed deer. It is sufficiently large to evaluate the ability of the habitat to support populations of these species, but small enough to not obscure effects of the alternatives. All of the actions proposed in the alternatives are contained within this area. Elk Habitat Analysis Units (HAU) were determined for the Flathead National Forest, for the purpose of analyzing summer habitat effectiveness, by wildlife biologists from the Forest and Montana Department of Fish, Wildlife, and Parks. Eight HAUs were used in this analysis. An additional assessment was also conducted to address cumulative effects and population viability concerns at the Forest scale (Exhibit Rg-1).

## Affected Environment

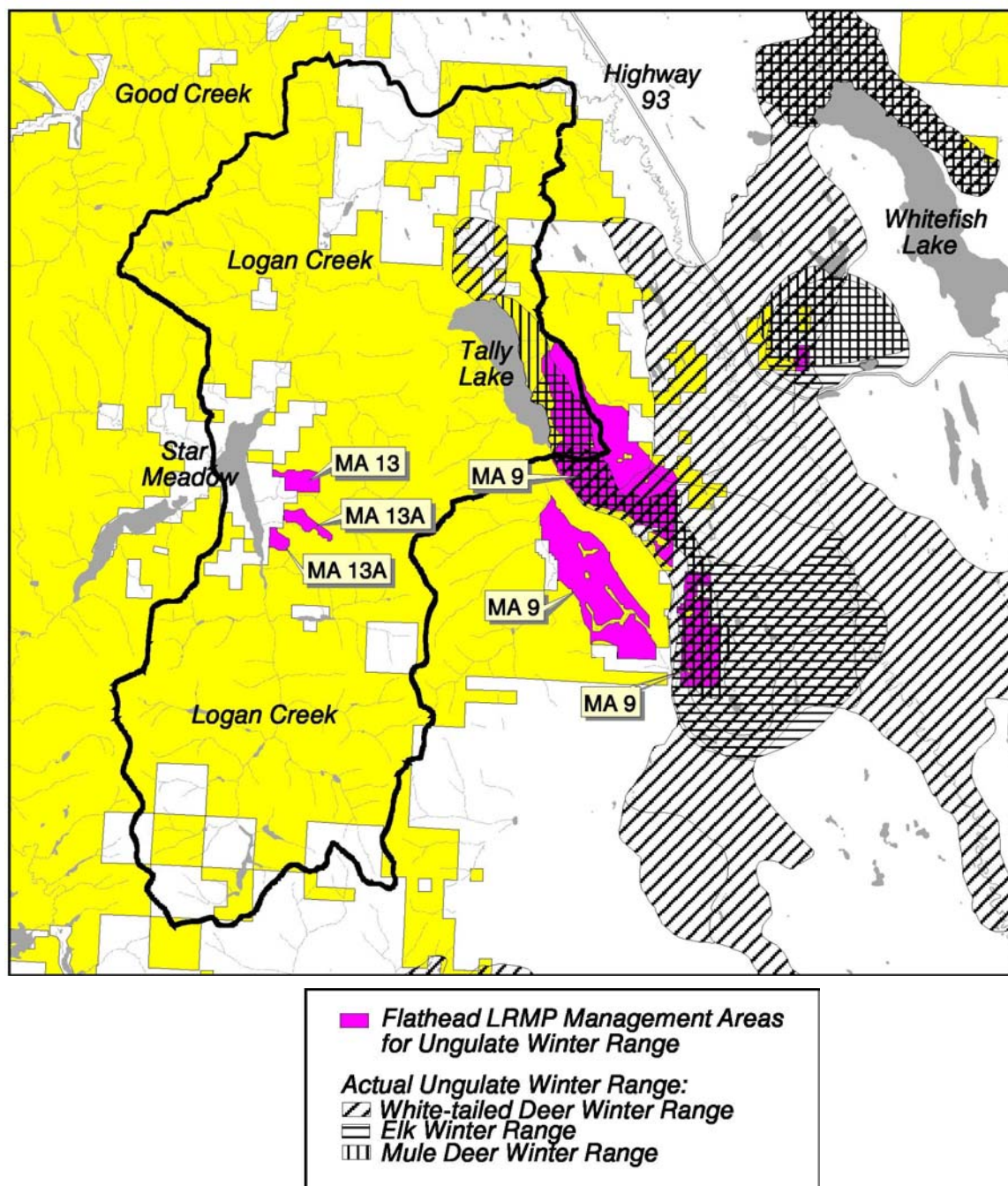
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The area provides year-round habitat for populations of elk, mule deer, white-tailed deer, and all species represented in LRMP direction as Commonly Hunted Management Indicator Species (Exhibit Rb-10). Elk and mule deer that use the analysis area are relatively common and their populations are thought to be stable. The steeper, rocky terrain of high-quality mule deer habitat is uncommon in the area, although mule deer are often observed in these drainages. White-tailed deer are the most numerous of the Big Game Management Indicator Species throughout the analysis area. White-tailed deer use of the analysis area is extensive due to the amount of intact riparian cover, the existing stands of conifer trees, and the abundance of available forage in past timber harvest units and in the nearby Star Meadow. This is despite the fact that, in the key use zones for white-tailed deer (Exhibit Rr-5), many regenerated timber stands are large. Moose use of the area is also relatively extensive; within the analysis area, many riparian sites support vegetative types preferred by moose. Mountain lion and black bear are also frequently reported.

A portion of the “Bowser/Tally” winter range is in the Logan Creek area, to the north and east of Tally Lake (Figure 3-10; Exhibit Rb-3). This 2230-acre area was mapped during interagency efforts in February 1993, primarily by MTFWP Wildlife Biologist Bruce Campbell. Various portions have overlapping winter use by elk, mule deer, and white-tailed deer. This area loosely matches MA 9 (white-tailed deer) winter range management areas as mapped for the Forest Plan (USDA Forest Service 1985).

About 390 acres in three other areas close to Star Meadow were designated as MA 13 and MA 13A elk/mule deer winter range management areas in the Forest Plan. However, these three areas apparently do not even have the potential to function as such (Exhibits A-1 and Rb-4). This is due to their small size, relatively high elevation (4400 to 4800 feet), relatively deep snow, and lack of ungulate foods. These areas near Star Meadow are not likely to be mapped as winter range management area when the Forest Plan is revised (pers. comm. Sweeney, 2003; Exhibit Rb-4). Units 41, 41A, and 133 have extensive tree mortality due to Douglas-fir beetles.

Figure 3-10. LRMP Winter Range Management Areas and MDFWP Mapped Winter Range.



Available hiding and thermal cover is plentiful and evenly distributed across the analysis area. About 89 percent of the analysis area currently functions as hiding cover; only natural openings and recently regenerated areas do not function as hiding cover. About 13,455 acres are sapling or shrub hiding cover (Exhibit Rb-8). The fire history of the analysis area indicates large patches of hiding cover and summer thermal cover, both preferred by ungulates, were usually present. In stand-replacing fire regime areas, large patches of hiding cover were usually available, particularly along ridges and benches. Historically, cover value was fairly constant in mixed-severity fire regime areas. Local use by elk probably declined immediately after large stand-replacing fires, then rebounded as forage increased dramatically, unless tree downfall became too thick for much plant growth. Based on extrapolations from the fire history analysis of the adjacent Good Creek area, hiding cover may have typically varied from 58 to nearly 100 percent. Overall, there appears to be more cover than was typically available historically, based on Historic Range of Variability data (Table 3-72). See the Vegetation section of this chapter for explanations of Ecological Sub-Regions, Historic Range of Variability, and TSMRS.

**Table 3-72. Current and Historical Metrics Relevant to Ungulate Summer Range habitat in two Ecological Sub-Regions (ESRs) (Exhibit Rb-8).**

	<b>ESR #19</b>	<b>ESR #20</b>
Drainages in Logan EAWS represented by these ESRs	Evers, Star lower Logan, Upper Logan	Tally Lake, Sanko
Current mean & median for cover * across ESRs	78.3%, 57.2%	70.9%, 54.8%
Historical mean & median for cover * across ESRs	68.0%, 53.4%	71.1%, 55.5%
Current Cover * in Logan Creek analysis area (by HRV structure data)	72.2%	70.6%
Current Cover in Logan analysis area (calculated from TSMRS queries)	Approximately 90%	

\* Cover estimated as Stand Exclusion Closed Canopy (SECC), Young Forest Multi-Story (YFMS), Understory Reinitiation (UR), and Stand Exclusion Open Canopy (SEOC). See the Vegetation section or glossary for definitions of these forest structural classes. Hiding cover would likely be provided by all of these structural classes; only some of the UR and SEOC would provide thermal cover.

Past timber harvests have narrowed or severed forested connections. Several forested linkages are less than 650 feet wide; some are less than 300 feet wide (Exhibits Q-17, Rb-9, Rg-7, and Rg-9). Six large patches of early-seral/structural stage habitat that have not yet regained hiding cover value for big game are scattered across the analysis area, requiring travels of up to a mile to cross in some directions. See the “Old Growth Habitat and Old Growth Associated Wildlife Species” section of this chapter for more information.

Most (98 percent) of the foraging habitat has hiding cover nearby. Lack of adjacent hiding cover makes some areas of forage unavailable (Exhibit Rb-9). About 129 acres, or 0.2 percent of the analysis area, appears to support elk foods but is over 600 feet from hiding cover and is thus less likely to be used by elk. This is fairly evenly distributed, with much of this unavailable forage near Star Meadow.

The maintenance of security during the hunting season is of particular concern for elk. Big game harvest data indicate a declining representation of branch-antlered bulls, an indication of excess vulnerability. The analysis area contains all or parts of eight elk hunting season security areas (Exhibit Rb-1), which are defined as at least 250 acres of cover, all farther than one-half mile from an open road. The security areas are well distributed across the analysis area, with moist sites scattered throughout. Many of the security areas are less effective because they contain roads open to motorized use in the summer, closing just before hunting season. Five of the Habitat Analysis Units (HAUs) have trails open to motorized use during hunting season. Hillis, whose recommendations appear to be applicable to the Flathead National Forest (USDA Forest Service 1993), recommended that at least 30 percent of an elk herd unit should provide hunting season security area for elk. Although 33.2 percent of the Logan Creek area is elk hunting season security area, three of the HAUs (Sanko Smoke Evers, Oettiker Reid, and Taylor Bill Meadow) have less than 30 percent security area (Table 3-73).

**Table 3-73. Existing Hunting Season Elk Security Area, by Elk Habitat Analysis Unit (Exhibit Rb-1).**

<b>Elk Habitat Analysis Unit (HAU)</b>	<b>Acres in HAU</b>	<b>Hunting Season Security Area Acres (and % of HAU or Logan portion)</b>	<b>Comment</b>
Lower Sheppard Star	14,923	0 (0%)	1,470 acres in Logan analysis area, all close to roads open yearlong
Lower Stillwater	13,323	1,422 (34%)	4,160 acres in Logan analysis area
Oettiker Reid	10,108	2,813 (28%)	Security area reduced by about 540 acres by motorized use of trails.
Round Meadow	9,062	2,134 (43%)	5,003 acres in Logan analysis area
Sanko Smoke Evers	12,437	2,898 (23%)	Security area reduced by about 1,200 acres by motorized use of trails.
Tally Lake	7,130	2,170 (30%)	Security area reduced by about 900 acres by motorized use of trails.
Taylor Bill Meadow	11,500	2,206 (19%)	Security area reduced by about 630 acres by motorized use of trails.
Upper Logan	9,411	7,418 (79%)	Most of the HAU is the “Cyclone Creek” motorized vehicle closure area

State open road density objectives for elk management are not met in two of the five elk Habitat Analysis Units for which we have complete data (Table 3-74). These are the Oettiker Reid and Sanko Smoke Evers HAUs, both of which have more than 1.7 miles per square mile open in the summer. Also shown in this table, motorized use is allowed on several miles of trails. Motorized traffic is allowed during hunting season in what otherwise would be extensive hunting season security areas for elk in the Tally Mountain/Reid Divide area. The road mileages and densities on lands administered by the Forest Service in the analysis area are as shown in Table 3-75. Road restrictions in the analysis area are generally effective (Exhibit Rg-6).

**Table 3-74. Road and Trail Management in the Logan Creek analysis area by Elk Habitat Analysis Unit (Exhibit Rb-2).**

Elk Habitat Analysis Unit	Miles within Logan Creek Area			Open Road Density		Miles of Motorized Trails
	Open Yearlong	Seasonal	Total Roads	Summer	Hunting Seas.	
Lower Shep Star Mdw	3.89	2.38	6.27	2.69 *	1.67 *	0.00
Lower Stillwater	5.93	1.43	7.36	1.14 *	0.92 *	4.18
Oettiker Reid	16.12	11.47	27.59	1.75	1.02	0.00
Round Meadow	9.64	4.39	14.03	1.80 *	1.24 *	1.93
Sanko Smoke Evers	26.07	9.95	36.02	1.86	1.34	1.72
Tally Lake	6.41	0.64	7.05	0.63	0.58	9.07
Taylor Bill Meadow	24.60	3.05	27.65	1.55	1.37	7.27
Upper Logan	0.12	0.00	0.12	0.01	0.01	2.51

\* Value is for the Logan analysis area portion of HAU only.

**Table 3-75. Road densities across Forest Service Lands in the analysis area, based on GIS “arc-lengths” (Exhibit Rg-8)**

Travel Management Category	Road Miles	Road Density
Open in summer	126 miles	1.27 miles per square mile
Open fall through spring (includes hunting season)	93 miles	0.99 miles per square mile

Moist sites are also an important characteristic of elk habitat. Management considerations for these moist sites have been outlined in the Flathead National Forest’s LRMP (pages II-22 and II-23). Numerous wet meadows, ponds, seeps, and springs are well distributed across the analysis area (see the “Water Resources” and “Riparian and Wetland Wildlife Habitat” sections of this chapter), meeting the definition of “elk moist sites” as defined by the LRMP and Lyon, et al. (1985). There are about 374 acres that appear to match most elements of these special habitats, although only about half of them consist of more remote, upper-drainage perched sites, which provide the best habitat (Exhibits Rr-3 and Rb-7). Such sites include some well-used elk wallows.

## Environmental Consequences

### *Direct and Indirect Effects*

#### **Alternative A – No Action**

No additional activities are proposed with this alternative. This would allow ungulate habitat across the analysis area to continue with relatively natural processes. The probability of intense fire would continue to increase in some areas as dead trees fall and new understory growth contributes fine fuels. This could result in the loss of extensive areas of cover. Elk security area availability (See Tables 3-84 and 3-85 that compare the no-action alternative with the action alternatives) would likely remain relatively stable, but does not meet the objectives in the Statewide Elk Plan (MDFWP 1992). If no further timber harvest, prescribed

burning, or wildland fire occurs over the next 15 years, about 95 percent of the area would function as hiding cover. Although it would be limited by the locations of open roads and natural permanent openings, the available hunting security area is also expected to increase over the next 15 years, as most of the harvested and/or burned stands would have regrown hiding cover (Exhibit Rb-1). Without fire or other disturbance, availability of high-quality grazing and browse forage would be expected to decline, most notably in the shrub fields in the Tally Mountain area. Indirectly, this alternative could decrease thermal cover in the winter range north and west of Tally Lake, due to increased beetle activity and risk of stand-replacing wildfire, as described in the “Vegetation” and “Fire and Fuels” sections of this chapter. Thermal cover changes would have the greatest effect in the “Bowser/Tally” Winter Range on and beyond the eastern edge of the analysis area (Exhibit Rb-3).

**Table 3-76. Open Road and Hunting Season Security Area Effects on Commonly Hunted Big Game Management Indicator Species (Exhibits Rb-1 and Rg-8).**

Alternative	Open Road Density (Summer & year-round) in miles per square mile	Hunting Season Security Area (Acres; % of analysis area)	
		After Implementation	Comparison with Existing
A	1.27 & 0.99	21,061 ac; 33.2%	(No change)
B	1.27 & 0.91	19,971 ac; 35.0%	- 1090 ac; - 5.2%
C	1.26 & 0.91	25,450 ac; 42.3%	+ 4389 ac; + 20.8%
D	1.27 & 0.91	21,304 ac; 35.4%	+ 243 ac; + 1.1%
E	1.26 & 0.91	20,579 ac; 34.2%	- 482 ac; - 2.3%
F	1.26 & 0.91	23,244 ac; 38.6%	+2183 ac; + 10.4 %

**Table 3-77. Percent of Elk Habitat Analysis Units in Hunting Season Security Area, by Alternative (Exhibit Rb-1). HAU with less than 30% elk security area are shaded.**

Elk Habitat Analysis Unit (HAU)	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Lower Stillwater *	34.0%	24.0%	34.0%	29.4%	24.0%	34.0%
Oettiker Reed	27.8%	21.7%	33.1%	25.8%	25.7%	31.1%
Round Meadow *	42.7%	38.4%	41.6%	42.0%	38.5%	40.6%
Sanko Smoke Evers	23.3%	21.7%	33.1%	23.0%	21.7%	22.1%
Tally Lake	30.4%	29.5%	42.0%	29.5%	29.5%	40.6%
Taylor Bill Meadow	19.2%	24.9%	35.5%	26.8%	25.9%	32.4%
Upper Logan	78.8%	76.2%	78.8%	77.9%	77.3%	77.3%

\* Values are for the Logan analysis area portion of HAU only.

### **Alternatives B, D, and E**

These alternatives would harvest or burn in hiding and thermal cover areas (Table 3-78). Depending on numerous variables in the stand conditions and the prescriptions (Exhibit Rb-8), current hiding cover would be either temporarily lost or reduced in quality. Some managed stands are expected to have greatly improved hiding cover conditions 10 to 20 years sooner than unmanaged stands, which would also improve conditions in regard to connectivity. Precommercial thinning is not expected to reduce hiding cover values for large mammals, except possibly in the 200 to 300 foot wide fuel treatment zones adjacent to private lands. As most of the logging operations and slash treatments would occur in the summer and



fall months, some displacement of big game is likely to occur. Most timber harvest activities would be concentrated in one or two subdrainages at a time to minimize disturbance. Slash levels would not impede ungulate movement.

**Table 3-78. Harvest and burning in areas providing hiding cover for large mammals (Exhibits Rb-8 and Rb-9).**

Alt.	Total harvest and burning affecting hiding/thermal cover	Hiding cover temporarily lost	Hiding cover quality reduced	Unavailable forage
A	0 ac	0 ac	0 ac	129 ac
B	7372 ac	5824 ac	1548 ac	827 ac
C	4983 ac	3236 ac	1747 ac	438 ac
D	5472 ac	3277 ac	2195 ac	549 ac
E	7063 ac	5219 ac	1844 ac	792 ac
F	6269 ac	3790 ac	2479 ac	681 ac

These alternatives generally follow Morgan's recommendations (Exhibit Rb-5) as well as those of Riley and Cross (Exhibit Rb-6). A 75-foot minimum buffer around all riparian areas would be left uncut. All action alternatives propose to retain most of the large windfirm trees and snags in all units. From 234 to 754 acres of regeneration harvest are proposed in the pole and immature timber stands preferred by white-tailed deer (Morgan 1993) (Exhibit Rb-8).

Major forested connections would be severed or substantially narrowed in several places (Exhibits Rb-9 and Rg-9). This would vary from 12 (Alternative D) to 33 connections (Alternative B), along with numerous additional places where connectivity would be severed, but a reasonable alternative forested route would remain. In some areas, removing dead trees may improve travel conditions for ungulates, as high densities of trees would otherwise continue to fall to the ground and might slow travel.

These three alternatives would have positive and negative effects on the availability of forage (Table 3-78), although forage is not limited in the Logan drainage due to past timber harvest. Most of the underburning would be expected to stimulate grass and shrub species. Supplemental shrub planting in harvest units may be implemented if funding is available. This would enhance big game forage, feeding and nesting sites for songbirds, and hiding cover values for a wide variety of wildlife species. However, numerous regeneration units would be located adjacent to recently harvested areas that have not yet regrown hiding cover (Table 3-78, and Exhibit Rb-9). From 438 to 827 acres of new areas of forage would be made unavailable to elk. The largest contiguous area, north of the Meadow Creek drainage, is 210 acres in Alternative B and 135 acres in Alternative D.

Access changes in the Taylor Creek drainage in these alternatives would add nearly 1200 acres of hunting season elk security (Exhibit Rb-1). However, several commercial harvest units and part of the proposed prescribed burn near Tally Mountain would remove cover, leading to a net decrease of security area in Alternatives B and E and a small net increase in Alternative D (Table 3-76). Elk security area would not be sufficient to meet the Statewide Elk Plan objectives (MDFWP 1992) in five of the seven HAUs (Table 3-77). All public road closures would remain in effect during operations.

Harvest and road construction would occur adjacent to or within 200 feet of three areas that appear to be “elk moist sites” that are either known or suspected to function as wallows. These proposed activities can displace elk from these sites, as well as remove screening cover. These are seepy areas or wetlands in the Sanko, Oettiker, and Taylor Creek drainages (Exhibit Rb-7). The harvest units involved would be 21, 59, and 133. Proposed system roads would not pass within 1500 feet of these sites; one proposed temporary road would terminate about 700 feet from a moist site. In Alternatives B and E, an indirect effect of construction of proposed System Roads 18 and 22 would be to enable some of the road construction and timber harvest in the adjacent Good Creek drainage, as disclosed in the Good Creek Resource Management Project Record of Decision (March 2000). Good Creek’s System Roads 18 and 22 would cross or pass within a few hundred feet of moist sites near Johnson Peak (Exhibit Rb-7). These roads would not be built under Alternative D.

Approximately 122 acres of timber harvest and hand piling are proposed in the “Bowser/Tally” winter range, which was mapped during interagency efforts in February 1993. A small portion (8 acres) of Unit 3 would negate hiding and thermal cover along the far northwest edge of the winter range. Commercial thinning in 21 acres of Unit 2, underburning in 13 acres of Unit 200, and handpiling in 80 acres of Unit 300 would maintain thermal cover due to the dense nature of these stands and the understory treatments. On these 114 acres of lighter treatments, winter range habitat values would be more likely to be extended over time through reduced risk of insect epidemic and wildland fire. No project activities would occur in actual ungulate winter range between October 15 and April 15.

From 223 to 235 acres of underburning or regeneration harvest would occur in what is now mapped as three small areas of LRMP Management Areas 13 and 13A. This would be parts of Units 41, 41A, 51 (dropped in Alternative D), 52, 133, and 203. Underburning would occur in 60 of these acres (Unit 203), maintaining thermal cover. These three small areas are close to Star Meadow, and, even though they are in MA 13 and MA 13A, they do not have the potential to function as ungulate winter range (Syme, pers. comm. 2003; Their, pers. comm. 2003; and Exhibits A-1 and Rb-4). Nevertheless, if any of the MA 13 or 13A portions of these units would be part of the selected action, a temporary project-specific Forest Plan amendment would be required. The first project-specific amendment would temporarily amend the Management Area 13 standards to allow for timber harvest without the harvest being specified in a Long Range Mule Deer and Elk Winter Range Activity Schedule for MA 13 lands in the project area. The second would temporarily amend the Management Area 13A standards to allow timber harvest for MA 13A lands in the project area.

Other aspects of these three alternatives would not be expected to have any measurable effects on ungulates.

Overall, there could be an effect on ungulate species’ movements or habitat use patterns, but no change would be expected in ungulate population numbers or their availability to hunters or predators, or as carrion.

### **Alternative C – Wildlife Security**

This alternative would harvest or underburn in high-quality hiding cover as shown in Table 3-78. The qualitative effects of this would be as described above for Alternative B. Major forested connections would be severed or substantially narrowed in 16 places (Exhibit Rg-9), along with numerous additional places where connectivity would be severed but a reasonable alternative forested route would remain. As in Alternative B, removing dead trees may improve travel conditions for ungulates in some areas. Few foraging areas would be made newly unavailable to elk, since units that contributed substantially to this effect were dropped or modified. There would also be less displacement of ungulates from activities associated with harvest and burning, as many units that are distant from open roads were dropped.

The dramatic improvement in hunting season security values for elk in this alternative may improve the harvest of brow-tined bulls, which the MDFWP Elk Plan notes “has declined in recent years” (MDFWP 1992). This is mostly due to no longer having motorized trails through parts of the Reid Divide and Johnson Peak areas, along with selection of commercial harvest units and retention of additional trees wherever possible. This is in addition to the road access changes included in the other action alternatives. Elk security would be increased by a total of 4389 acres (Tables 3-84 and 3-85, above, and Exhibit Rb-1). Under this alternative, elk security area and other factors would be sufficient to meet Statewide Elk Plan (MDFWP 1992) objectives.

Harvest near “elk moist sites” would be as described for Alternatives B, D, and E. However, the indirect effects on moist sites in the adjacent Good Creek drainage would be avoided, since Roads 18 and 22 would not be constructed in this alternative.

About 184 acres of underburning or regeneration harvest would occur in what is now mapped as three small areas of LRMP Management Areas 13 and 13A. This would be parts of Units 41A, 133, and 203. Underburning would occur in 60 of these acres (Unit 203), maintaining thermal cover. These three small areas are close to Star Meadow, and, even though they are in MA 13 and MA 13A, they do not have the potential to function as ungulate winter range (Syme, pers. comm. 2003; Their, pers. comm. 2003; Exhibit Rb-4; and Exhibits A-1 and Rb-4). Nevertheless, if any of the MA 13 or 13A portions of these units are part of the selected action, a temporary project-specific Forest Plan amendment would be required. The first project-specific amendment would temporarily amend the Management Area 13 Standards to allow for timber harvest without the harvest being specified in a Long-range Mule Deer and Elk Winter Range Activity Schedule for MA 13 lands in the project area. The second would temporarily amend the Management Area 13A standards to allow timber harvest for MA 13A lands in the project area.

Timber harvest and hand piling in the “Bowser/Tally” winter range would be as in Alternatives B, D, and E.

Other aspects of this alternative would not be expected to have any measurable effects on ungulates.

Overall, there could be an effect on ungulate species’ movements or habitat use patterns. No change would be expected in ungulate population numbers or their availability to hunters or

predators, or as carrion, except that brow-tined bulls may become more common in the population.

### **Alternative F – Preferred Alternative**

This alternative would harvest or underburn in high-quality hiding cover as shown in Table 3-78. The qualitative effects of this would be as described above for Alternative B. Major forested connections would be severed or substantially narrowed in two places (Exhibit Rg-9), along with numerous additional places where connectivity would be severed, but a reasonable alternative forested route would remain. As in Alternative B, removing dead trees may improve travel conditions for ungulates in some areas. Few foraging areas would be made newly unavailable to elk, since units that contributed substantially to this effect were dropped or modified. There would also be less displacement of ungulates from activities associated with harvest and burning, as many units that are distant from open roads were dropped.

The dramatic improvement in hunting season security values for elk in this alternative may improve the harvest of brow-tined bulls, which the MDFWP Elk Plan notes “has declined in recent years” (MDFWP 1992). This is mostly due to no longer having motorized trails through parts of the Reid Divide area, along with selection of commercial harvest units and retention of additional trees wherever possible. This is in addition to the road access changes included in the other action alternatives. Elk security would be increased by a total of 2183 acres (Tables 3-84 and 3-85, above, and Exhibit Rb-1). Under this alternative, elk security area and other factors would be sufficient to meet Statewide Elk Plan (MDFWP 1992) objectives in six of the seven Elk HAU. In the Sanko Smoke Evers HAU, the security area is reduced about 1,200 acres by motorized use of trails. All public road closures would remain in effect during operations.

Harvest near “elk moist sites” would be as described for Alternatives B, D, C, and E. Indirect effects on moist sites in the adjacent Good Creek drainage would be as described above for Alternatives B, C, and E.

About 169 acres of underburning or regeneration harvest would occur in what is now mapped as three small areas of LRMP Management Areas 13 and 13A. This would be parts of Units 41A, 133, and 203. Underburning would occur in 60 of these acres (Unit 203), maintaining thermal cover. These three small areas are close to Star Meadow, and, even though they are in MA 13 and MA 13A, they do not have the potential to function as ungulate winter range (Syme, pers. comm. 2003; Their, pers. comm. 2003; Exhibit Rb-4; and Exhibits A-1 and Rb-4). Nevertheless, if any of the MA 13 or 13A portions of these units are part of the selected action, a temporary project-specific Forest Plan amendment would be required. The first project-specific amendment would temporarily amend the Management Area 13 Standards to allow for timber harvest without the harvest being specified in a Long-range Mule Deer and Elk Winter Range Activity Schedule for MA 13 lands in the project area. The second would temporarily amend the Management Area 13A standards to allow timber harvest for MA 13A lands in the project area.

Approximately 122 acres of timber harvest and hand piling are proposed in the “Bowser/Tally” winter range, which was mapped during interagency efforts in February 1993.

Commercial thinning in 21 acres of Unit 2 and 8 acres of Unit 3, underburning in 13 acres of Unit 200, and handpiling in 80 acres of Unit 300 would maintain thermal cover due to the dense nature of these stands and the understory treatments. In all of these areas, winter range habitat values would be more likely to be extended over time through reduced risk of insect epidemic and wildland fire. As in all other action alternatives, no project activities would occur in actual ungulate winter range between October 15 and April 15.

Other aspects of this alternative would not be expected to have any measurable effects on ungulates.

Overall, there could be an effect on ungulate species' movements or habitat use patterns. No change would be expected in ungulate population numbers or their availability to hunters or predators, or as carrion, except that brow-tined bulls may become more common in the population.

### ***Cumulative Effects***

Past fires, timber harvest, and salvage harvest on national forest, corporate, and private lands across the analysis area have resulted in a complex matrix of forested interior habitat, edge, ecotones, and openings in various stages of succession. Past timber harvest converted a considerable amount of the hiding and thermal cover into seedling stands, some of which have progressed to sapling hiding cover. No vegetation management activities are planned on national forest lands in the analysis area in addition to those proposed in the action alternatives. Timber harvest and road construction in the adjacent Good Creek drainage is expected to continue under the 2000 Good Creek Resource Management Project Record of Decision. The extent of the effects of the Good Creek Project on ungulates will in part depend on which alternative is selected in the Logan Creek Ecosystem Restoration Project.

A reasonably foreseeable action would be measures to control tansy ragwort and other weed species, which would not have negative effects on ungulates.

Numerous recreational opportunities across the analysis area, including big game hunting, can cause displacement or mortality of big game species. Tree harvest has removed hiding and screening cover along open and closed roads. Open road densities are as described above for the existing situation. Human population and access are dramatically increased over historical conditions. Ease of human access has stabilized over the last decade or so, as new roads built for logging are generally reclaimed or closed soon after use. In the Logan Creek area, the Forest Service has no plans or intentions to restrict access on main routes, particularly when they reach private land.

White-tailed deer are more adaptable to large landscape fragmentation and roading than are elk, and they probably have not been impacted as directly from past human activities. Overall, past harvest and fires have improved available food sources for white-tailed deer. Across the analysis area, as well as across the bulk of the Tally Lake Ranger District, white-tailed deer numbers appear to be climbing, despite high hunting permit numbers and relatively easy motorized access.

This species' affected environment described above has been shaped by past and present cumulative effects to this species. These effects would be cumulative to those discussed above for each alternative.

## REGULATORY FRAMEWORK AND CONSISTENCY

Flathead National Forest LRMP Amendment 21 establishes a Forest-wide goal to “provide appropriate habitat and access to maintain desired hunting, fishing, and viewing opportunities, in coordination with the Montana Department of Fish, Wildlife, and Parks.” The Flathead LRMP has identified white-tailed deer, elk, and mule deer as Commonly Hunted Big Game Management Indicator Species (MIS) that use general forest habitat. Conditions favorable to these species would generally also benefit other big game species, such as moose, black bear, and mountain lion, which are considered under the umbrella of Forest-level MIS evaluation.

The MDFWP includes habitat goal recommendations in their big game management plans, specifically the Statewide Elk Plan (MDFWP 1992). USFS Region One direction includes having at least one NEPA alternative comply fully with the State's plan, and LRMP Amendment 21 has an objective to provide sufficient habitat to contribute towards meeting the objectives of MDFWP's management plans. The State elk plan calls for a 30 percent increase in elk population in the Salish Elk Management Unit, which includes the Logan Creek area. It has been recommended that for a stable or increasing population and for opportunities to maintain or harvest large bull elk, at least 30 percent of an elk herd unit should be in hunting season security area (USDA Forest Service 1993; Hillis, et al. 1991). Alternative C exceeds the recommendations in the State Plan by increasing the hunting season elk security area to over 30 percent in all elk HAUs. Alternative C thus fulfills the USFS Region One requirement of having at least one NEPA alternative comply fully with the State's plan. The Habitat Management Strategies for this area emphasize the need for consideration of elk security in planning management activities and maintaining a maximum open road density of no more than 1.5 miles per square mile during hunting season and 1.7 miles per square mile the rest of the year (MDFWP 1992). All alternatives meet both of these values at the analysis area scale, although two of the Elk HAUs have higher road densities in the summer. The LRMP Amendment 21 objective to provide sufficient habitat to contribute toward meeting the objectives of MDFWP's management plans is met by all action alternatives.

Moist sites are also identified as an important characteristic of elk habitat and management considerations have been outlined in the LRMP (pages II-22 and 23). These apply to all management areas, in accordance with the following selected recommendations from the Coordinating Elk and Timber Management, Final Report of the Cooperative Elk-Logging Study, 1970-1985, January 1985 (Forest Plan Appendix DD):

- a. “Moist sites,” composed of specific habitat types, topographic situations, and elevations, would be managed according to the habitat type moist site recommendations.
- b. Areas with “Moist Sites” would be managed during the elk use period, with open road densities that average one mile or less per square mile.

- c. “Security Areas,” composed of areas associated with the moist sites that provide security and other necessary components of elk summer habitat, would be managed according to the security area recommendations.
- d. In both “Moist Sites” and “Security Areas,” slash in managed stands would be reduced to levels that do not impede elk movement.

Standards for moist sites would be met by all alternatives, despite the effects of nearby harvest and road construction.

The Forest Plan considers ungulate winter range to be acceptable when 30 percent of the area contains winter thermal cover (a stand of evergreen trees having a minimum height of 60 feet and a minimum crown canopy of 70 percent). The main Forest Plan goal for MA13 and MA13A winter range is to provide the size, age, diversity, and distribution of cover and forage suitable for elk and mule deer winter habitat. Management Area 13 allows for timber harvesting to improve or maintain the relationships of cover to forage and elk summer range habitat management direction relates to ‘moist site’ and security areas protection. A temporary project-specific LRMP amendment would be required if these actions were selected. See also Exhibits Rb-3 and Rb-4.

All alternatives would comply with NFMA direction that wildlife habitat be managed to maintain viable populations of existing native and desired non-native species well distributed across the planning area. The analysis for LRMP Amendment 21 assessed the forest-level viability of elk and mule deer (USDA Forest Service 1999a). Regardless of scale, species viability is not a concern for elk or mule deer. These species are habitat generalists, and habitat occurs literally throughout the western United States. All indications are that healthy populations are well distributed across the western states, Montana, and the Flathead National Forest. In Montana and on the Flathead National Forest, this is evidenced by liberal hunting seasons administered by the Montana Department of Fish, Wildlife, and Parks. In northwest Montana the rapid recovery of the gray wolf is also evidence of substantial ungulate populations, which comprise their primary food source. See Exhibit Rg-1 for more information.